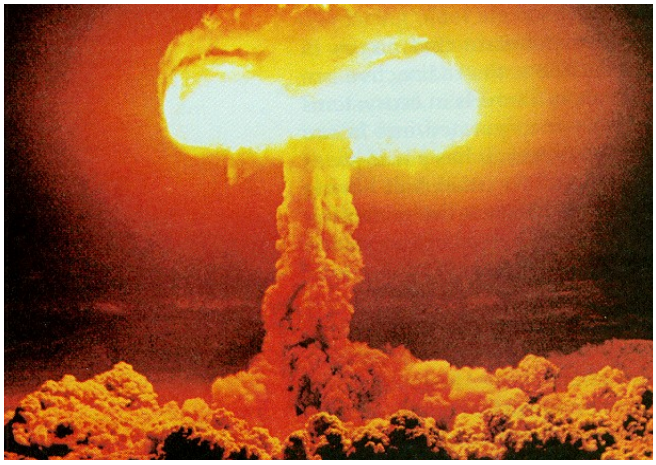
A Long-Term Survival Guide - Surviving Atomic Weapons (Part 1):



A lot of nonsense has been written about nuclear weapons since they were invented, mostly intended to scare people into believing that atomic bombs can destroy all life on earth.

Hollywood eagerly jumped on the bandwagon as well, producing an almost endless number of nuclear disaster movies that promote the dramatic idea of being doomed, and downplaying the truth that survival after an atomic attack is almost inevitable.

Scaring the population with lies and distortions has become a way of life for those who want to manipulate us, because the truth doesn't support their evil agendas.

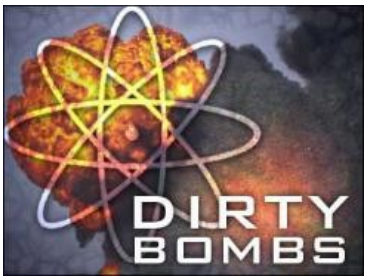
The truth is that most people would survive a terrorist attack using a dirty bomb, most people would survive a terrorist attack using a stolen atomic bomb, and most people would survive even if there was an all-out nuclear war.

Notice how Japan is still there, even though two major Japanese cities were nuked by the US during the war, in a professional military attack?

The biggest danger with an atomic weapon is not the weapon itself, but the misinformation about what it can and cannot do, because more people will die from panic and bad decisions (caused by lack of knowledge) than from actual bomb damage.

This (two-part) article is intended to show you the truth about the effects of nuclear weapons, tell you how to protect yourself, and suggest some things you should do in advance. Once you know what to do, you will see that surviving an atomic attack is just not that difficult.

Physics and economics limit terrorist attacks with atomic weapons to two basic tactics; the dirty bomb, and the stolen (or black market) suitcase nuke. Terrorists simply will not be using ICBMs, high-altitude EMP bursts, 100 megaton hydrogen bombs, neutron bombs, or even air bursts, due to many basic, practical problems with all of these, so we can concentrate on the two realistic threats. Part one of this article will cover dirty bombs, and part two will cover conventional atomic bombs.



Part One - Dirty Bombs: The dirty bomb is just an ordinary bomb, that is used to disperse stolen radioactive material. Conventional explosives would be detonated next to containers of stolen radioactive waste, or spent fuel rods, or depleted uranium waste, to throw a cloud of radioactive dust into the air. The bomb is merely an attention-getting device, as dumping the rad waste quietly onto a city street would be almost as effective, but wouldn't make national news headlines.

Rad waste, old fuel rods, or DU (depleted uranium) are likely ingredients of a dirty bomb.

Terrorists would explode a dirty bomb in some major city center, trying to contaminate a densely populated area, hoping to create a panic, based on people's lack of understanding of radioactivity.

The conventional explosives in a dirty bomb tend to hide the release of the rad waste.

The main danger of dirty bombs is the time it takes people to find out that radioactive materials were spread all over the attack site. Since a dirty bomb looks just like a normal terrorist attack, survivors, rescuers, and anyone down-wind of the blast will not know that the dust and smoke is radioactive, and so they will not protect themselves from the rad threat, even if they know how.

It really doesn't matter if the dirty bomb is loaded into a truck and detonated on a city street, or inside a building's parking structure, or if it is loaded onto a plane and then flown into a building. The results will basically be the same, and the steps that you should take to protect yourself will also be the same. These are: Recognize the danger, Protect yourself, and Escape the danger zone.

Dust and smoke from a dirty bomb will create an invisible danger area, full of radiation.

The radioactivity from a dirty bomb is very different from the radioactive fallout produced by a normal atomic bomb. It will be the scattered remains of the stolen radioactive materials used to make the bomb. There won't be that much radioactive material, as compared to a real nuclear weapon (probably a few hundred pounds at most), but it will have a much longer half life than a conventional nuke. Instead of being dangerous for a mere two or three weeks before decaying to safe levels (like a normal nuke's fallout), the radioactivity from a dirty bomb will be dangerous for years, or even decades, without an extremely expensive and time-consuming cleanup of the area.

The good news is that the radioactive dust and smoke from a dirty bomb will only contaminate a tiny portion of the city center of whichever major city is attacked by terrorists. (We emphasize major cities, because smaller targets will be considered a waste of resources by terrorists – they want to harm and scare as many people as possible, so they won't be attacking Rhode Island.)

Unless you happen to be less than a quarter of a mile from the actual site of the explosion (or directly down-wind of it), you will be almost perfectly safe from the attack itself. But there are several dangers that you will still be exposed to, so you need to know what these will be, and what to do about them, to stay as safe as possible.

First, you should treat any terrorist attack as though it was a dirty bomb attack, because you can't depend on the government, or news organizations, to give out accurate warnings in time. In fact, there may not be any official confirmation of the presence of radioactivity for hours, or even days.

For this reason, the safest course of action is to simply stay away from any terrorist bombing sites. This includes avoiding driving through them later, or driving past the site, on the down-wind side.

The dust from a dirty bomb will contain very long-lasting, very dangerous radioactivity.

Once a dirty bomb has been used, it is very likely that the contamination will slowly be spread over a huge area, through a number of routes that you may not have considered. People fleeing the blast area will carry some of the radioactive dust with them, and so will rescuers and their vehicles. Subways, taxis, buses, ambulances, police cars, and civilian traffic will spread the dust somewhat, and it will most likely be tracked into area hospitals, fire stations, and police stations, by the activities of rescue crews trying to save bomb victims, before anyone has detected its presence.

Pigeons covered with radioactive dust would fly around the city, before dying from the radiation.

Animals that were in the attack zone, or that pass through it after the bombing, will carry some of the radioactive dust with them when they leave. Birds (pigeons) and small mammals (rats) could carry dangerous amounts of the radioactive dust into other areas of the city, including crowded sidewalks and public parks, and even into office buildings, stores, restaurants, and apartments. You need a survival strategy that will stop you from unknowingly contacting any of these smaller rad contamination sources. The last thing you want is to have your child walk up to you with a contaminated animal, and say “Look, this pigeon just let me pick him up. Can we keep him?”

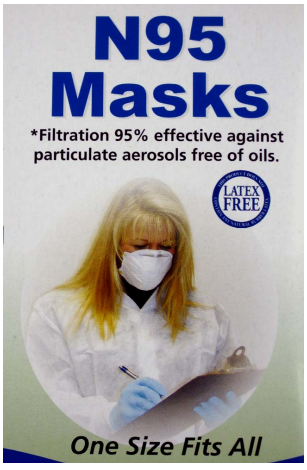
After a dirty bomb, rats will carry the rad dust into kitchens and ventilation ducts, before dying.

The smartest thing that you can do, after any terrorist bombing in your city, is to leave town for a week or two. This may sound extreme, but it is good advice. This simple move will put a safe distance between yourself and any possible radiation danger. You can come back after the all clear, or if radiation is discovered at the attack site, you will not be caught up in the resulting local panic.

Unsuspecting people near the dirty bomb blast zone may absorb lethal doses of radiation.

I also highly recommend that you buy some personal protective gear for yourself and your friends and family, and that you buy some radiation detection equipment (It's the only way to be sure).

The reason that protective gear is important, is that even very small amounts of radioactive dust and smoke are very damaging to the human body, if inhaled or ingested. If you get radioactive dust on your skin, you can wash it off, but once it gets into the nasal passages, lungs, or digestive tract, it will remain long enough to cause damage to your internal organs. (More on this a little later.)



The N95 protective mask will filter out 95% of all airborne particles, if fitted correctly.

Personal Protective Equipment, or PPE, is simple, basic gear that will protect your lungs, eyes, and skin. These are filter masks, safety goggles, gloves, and outer clothing, and you can add a surplus gas mask to the list, if you want. The trick with protective gear is having it available when you need it, so you should buy these items now, and make up little kits that you can keep at work, at home, in your car, or with you as you travel. A box of protective gear stored in your garage at home won't help you much, if a dirty bomb goes off close to your job site, while you are at work.

The minimum acceptable protective filter, to keep radioactive dust and smoke particles out of your nose and lungs, is a dust mask with an N95 rating. The N95 means that the mask will filter out 95% of all airborne dust and smoke particles, as long as you have fitted the mask to your face in the correct manner. (Some N95 masks also come with a built-in exhalation valve, which closes when you inhale.) Ordinary dust masks, which do not have the rating, are worse than useless, because they may fool people into thinking that they have protection, when they actually don't.

Some types of N95 dust masks have a small exhalation valve built into them.

This doesn't mean that only a commercially-made mask will protect you. Any fluffy hand towel can be folded in half, to make two thicknesses of material, then tied in place over the nose and mouth (or held in place with a tube-style neck scarf), and will also filter about 95% of all particles.

Don't trust the ordinary dust mask to protect you, because they don't seal or filter very well.

It is best to have more than one mask available for each person, as they must be replaced after becoming soaked with moisture from your breath, or if they filter out enough dust to become clogged up. Since you don't know how long it may take you to get out of a contaminated area, or just how dusty things may be, it is prudent to carry a few spare filter masks. They don't take up much room, they don't weigh anything, and they are fairly cheap, so buy plenty (while you still can). Like many other useful items, masks will suddenly become very scarce and expensive, the moment that the next terrorist attack takes place, so shop early, for best selection.

Reynolds
Great for Hams, too!
Oven Bags
Turkey Size
For Meats & Poultry 8-24 lbs.
Juicier, Tastier Holiday Meals
2 BAGS 19 IN x 23 1/2 IN (482mm x 596mm)

You can improvise a dust mask and hood, using a hand towel, tube scarf, and clear oven bag.

It is also important to remember that the dust trapped on your filter mask is going to be radioactive, so dirty masks should be handled with care, placed in sealed plastic bags, and discarded a safe distance away from your living quarters.

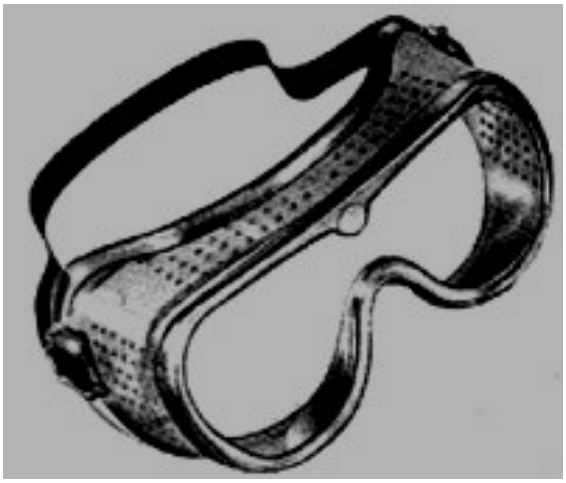
A hand towel can be folded in half and placed over the mouth and nose, and held in place with a tubular neck scarf. Add goggles, and a rain bonnet, plastic bag, or hooded poncho, and you will be protected from breathing most radioactive dust particles, so that you can escape the danger zone.

Painter's respirators cover the mouth and nose, provide a secure seal, and are good dust filters.

The next step up in breathing protection is the painter's respirator. The rubber face mask and larger retaining straps provide a secure mask-to-face seal, and most of these respirators have dual filters. These respirators cost more than rated dust masks, but will filter more dust, before clogging up.

Safety goggles are better than safety glasses, as they have eye protection on all sides.

Once you have an adequate filter mask, of whichever type, you need to add some eye protection. The best choice is a pair of safety goggles, because they provide protection from blowing dust on all sides, and because prescription glasses can be worn underneath the goggles, in most cases.



Another advantage to safety goggles is that most glasses can be worn underneath them.

There are also full-face respirators, which combine a mask and a face shield, providing respiratory and eye protection in a single unit. They cost more, but do a better job than two separate pieces.

Full-face respirators protect the mouth, nose, and eyes, with one piece of equipment.

Respiratory protection should be your highest priority, followed by eye protection, but you also need a protective outer garment, to keep as much radioactive dust off of your body as possible. While rad dust can be washed off the skin, it will cause beta burns (open, weeping sores) after being in contact with bare skin for several hours, especially dust particles trapped in skin folds.

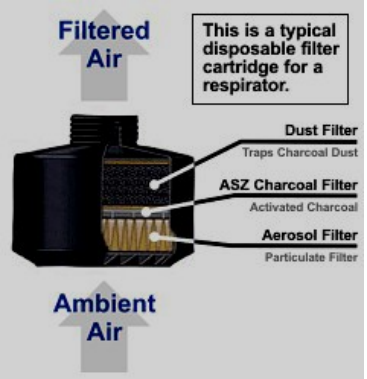
A hooded poncho is adequate as a protective outer garment, but a full rain suit is even better.

The best outer garment to protect you from rad dust will offer maximum head and body coverage, and will have a slick surface, like nylon or plastic. A hooded nylon rain suit is the best choice, but a hooded nylon poncho is adequate. The hood opening should have drawstrings, so that it can be closed down around your face protection, as much as possible. If your hood doesn't have a drawstring, it is easy to add one, by sewing a cord into a simple hem around the hood's edge.

Plastic ponchos or tarps can be used as protective outerwear, to escape a rad danger area.

If you can't get a nylon rain suit or poncho, you can substitute a cheap, disposable plastic rain poncho, or a body cover can be improvised from a plastic sheet, plastic tarp, or large trash bag.

Gas Masks: There are two basic types of surplus gas masks available for sale at military surplus stores. One type has an external filter cartridge that screws onto the mask, and the other type has filters that are integral to each side of the mask, and are called cheek filters. Both types of surplus gas mask are perfectly adequate for protecting you from radioactive dust and smoke particles.



Even an old surplus gas mask will still filter rad dust, as long as the filter isn't clogged.

Even if your surplus gas mask is so old that the activated charcoal inside the filter element has become inactive, the aerosol and dust filtering material that make up the rest of the filter cartridge will block rad particles. The activated charcoal portion of the filter was designed to absorb chemical warfare agents, which are basically poisonous chemical fumes. You won't need it to survive a dirty bomb attack. Just be sure to test your gas mask regularly, to stay familiar with it, and to make that sure the filters are functional, so that you can breathe ok with the mask in place.

Some surplus gas masks use a pair of cheek filters, to remove airborne contaminates.

Store your gas mask in a protective bag or plastic storage box, to keep it clean and in good repair. The military surplus stores that sell gas masks usually sell surplus gas mask storage bags as well.

Early gas mask designs had small eye holes, but later versions have larger lenses.

Surplus gas masks can be purchased for as little as ten dollars (or even less) between disasters, as the normal demand for such an item is very low. But as soon as there is some type of terrorist attack, the supply disappears, and prices shoot way up on any masks that are still available, so if you can motivate yourself to buy some masks in advance, you can protect a lot of people cheaply.

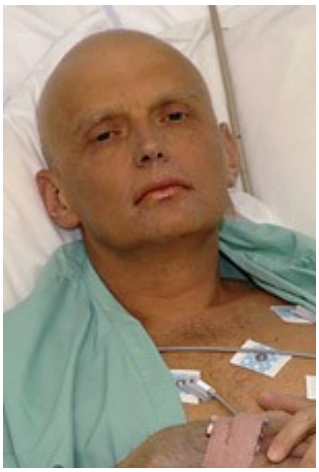
Modern gas mask designs use a large face shield, for a maximum field of view.

A protective hood is important, to keep rad particles out of your hair and clothing.

The prepared survivor will have protection for mouth and nose, eyes, head, body, and hands.

Hand protection is also important, both to keep radioactive dust particles from becoming lodged between the fingers and under the nails, and to prevent transfer of dust particles from the hands, to other parts of the body. Disposable rubber gloves, such as those used in the medical field, are ok, and the tear-resistant (nitrile) version of these gloves are even better. Long rubber gloves, such as the gauntlet-style used for dish-washing, are better still, as they provide more arm protection, and it is easier to seal the junction between gloves and sleeves with tape, if the gloves are longer.

Rubber gloves keep rad particles off the hands, and gauntlet-style gloves are even better.



If you think that protective gear looks silly, think how you would look with radiation sickness.

Foot Protection: You can also buy the type of disposable shoe covers that are used by medical staff in operating rooms, to protect your shoes from radioactive dust, if you want. But a pair of plastic bags and some tape make quick and easy improvised versions, at almost no cost.

Detection Gear: Buying your own radiation detection equipment, and always having it available, is the only way to be able to know for sure if you are being exposed to radioactivity, in time to take defensive actions. It would be great if there was some way for humans to detect dangerous levels of radiation without such gear, but we do not have the ability to sense ionizing radiation striking our bodies. It would also be nice if there were radiation detectors positioned throughout every major city, which would sound alarms in the event of a rad attack, but we have no such systems.

Surplus civil defense Geiger counters can't be trusted for detecting radiation from dirty bombs.

I would also like to be able to tell you that a cheap surplus civil defense Geiger counter will warn you of any radiation danger, but they are actually problematic, and are not suitable for use as a rad warning system, for several reasons. Without going into too much detail, they are badly designed, inaccurate, bulky, and the detectors tend to saturate and give false low readings of high rad levels.

# OF CHIRPS	R/hr	TIME TO 100R EXP
1	0.1	41.6 d
2	0.2	20.8 d
3	0.4	10.4 d
4	0.8	5.2 d
5	1.6	2.6 d
6	3.2	1.3 d
7	6.4	15.6 h
8	12.8	7.8 h
9	25.6	3.9 h
10	50+	< 2.0 h

The Nukalert, and the Gamma Watch, are the only two reliable portable radiation alarms.

There are only two radiation detectors currently available, that are worthy of being recommended for use as personal radiation warning equipment. The first is the Nukalert, which is a tiny alarm that is small enough to wear around your neck, or use as a key-chain. It currently costs about $160, has a ten-year battery life, and chirps if radiation is present, chirping faster at higher rad levels. A little chart on the back of the unit lets you gauge the radiation level.

The second suitable unit is the Gammawatch, which is a wristwatch that has a built-in Geiger counter and alarm, with a radiation level display for checking the local radiation level. It currently costs $250. Either of these units would give you the ability to detect a dirty bomb attack, by alarming the instant that you encounter a high level of radioactivity. If you can't acquire one of these, then please follow my advice about treating any terrorist bombing as though it was a dirty bomb attack.

The KFM (Kearny Fallout Meter) is a simple radiation detector that you can build for free.

There is also a design available for a home-made radiation detector, that you can build from common materials, for little or no cost. It is called a KFM, or Kearny Fallout Meter, and is named after the inventor, Cresson Kearny, who is also the author of the excellent book "Nuclear War Survival Skills". I won't give instructions for building the KFM here, as they are in his book, which is available for free download, on the net.

The KFM is a simple (but accurate) radiation detector that is basically a small metal can with two aluminum foil leaves hanging inside. To use it, you charge it with static electricity, causing the foil leaves to separate, and then observe to see how fast the static charge dissipates. The faster the leaves drop back together, the higher the local radiation level.

The KFM works quite well, but it is a manual system that has no alarms. To benefit from the KFM, you must build it correctly, you must learn how to use it, and you must be willing to keep it handy, so that it is available when needed. I personally like this detector, and feel that everyone with an interest in survival skills should practice making and using a KFM, even if you own a Nukalert or a Gammawatch. I would also encourage my children to make the KFM for their next school science project. This cool little invention might save their lives some day.

Mental Conditioning: The best way to prepare to cope with a dirty bomb attack, is to mentally rehearse what might happen, and think about how you should react to each possibility. Mental conditioning like this is surprisingly effective, as long as your plans are realistic. So let us say that you work in the heart of a large city, the most likely area to be the target of a dirty bomb attack. Here are a few basic scenarios that you should think your way through periodically, so that you will have these plans of action in mind, if your city is ever the target of a terrorist dirty bomb. Please note that these dirty bomb scenarios are generalizations; your terrorist attack may vary.

Scenario # 1: You are at work, when you hear that there has been an explosion a few city blocks away. Looking out an office window, you can see that a large cloud of dust and smoke is slowly drifting your way, carried directly towards your building by a light wind.

What to do: The best course of action is to assume that the explosion was a dirty bomb attack, don your protective gear, and evacuate the area, traveling in a direction cross-wind from the blast site (in other words, if the bombing was west of you, and the easterly wind is blowing towards you, flee north or south). Don't go towards the bomb site, and don't go down-wind. Even if you have a Nukalert or a Gammawatch, don't wait around to see if they alarm; leave early and beat the rush.

If you don't have any protective gear, you need to stay indoors just long enough to improvise some, and then you can use it to evacuate. Search your building for suitable materials to make a dust mask, eye protection, and a body cover. Check the janitorial closets for trash bags, towels, and cleaning rags. What you tell your co-workers, if anything, is up to you. I advise gathering materials quietly, improvising your protective gear in a restroom, and leaving by a back entrance, if possible.

Scenario # 2: You are at work, when you hear that there has been an explosion a few city blocks away. Looking out an office window, you can see a large cloud of dust and smoke, but the wind is blowing it away from your building. You decide to evacuate, only to become stuck on the freeway in a massive traffic jam, caused by panicked drivers who caused an accident up ahead. Looking in the rearview mirror, you see that the wind has shifted, and now the dust cloud is heading your way.

What to do: Again, it is wisest to assume that any bomb blast is radioactive. It would be best if you have an evac kit with you, so you can suit up and make your escape, but you can usually improvise some degree of protection from stuff in your car, if you know how.

Even if it is not ideal, you can take off your T-shirt, and use it as a dust mask. You can cut up one of your car seats, and use some of the foam rubber with the T-shirt, to make a better mouth and nose filter. Anything you have can be used as temporary protection, until you can reach better gear. If you have sunglasses, put them on. If you have a plastic trash bag or shopping bag, dump it out and make it into a head cover. If you have a suit in a garment bag, use the bag as a body cover. Even one of those thin dry-cleaning bags will keep the dust off. You get the idea.

If you could have made it to an off-ramp in your car, you could have driven away, but assuming that you are stuck in a traffic jam, you may have to abandon your vehicle, and flee on foot. If possible, travel cross-wind, and don't stop until you escape the danger zone, unless you can duck into a store or other building, and acquire better protective gear.

Scenario # 3: While shopping at the mall, you hear a loud explosion in the distance, and then the electricity goes out. You see a dust cloud outside the glass doors of the mall, and you notice that the skylights in the mall are also dim from the cloud, and they are growing darker as particles from the dust cloud start to accumulate on them. Some people are leaving in a hurry, while others are coming in from outside, to get out of the dust cloud.

What to do: As always, assume that there is radiation. Stay away from entrances, and dusty people coming inside. Go to the nearest restroom, and don your protective gear, if you have any. If the power is out, it will be harder to buy protective gear, if you don't have any, but if the power is on, you will have to worry about the building's ventilation system sucking the rad dust inside, so acquire what you need as fast as possible. Once you have the gear, evacuate cross-wind to safety.

Scenario # 4: You are commuting to work on the subway, when the power goes out, and your train slows to a halt. After waiting for over an hour, you leave the train and hike to the nearest subway station, only to hear people talking about a terrorist attack. The terrorists claim to have set off a dirty bomb in your city, and say that everyone in your city is going to die from radiation. You notice that dust is wafting down the subway stairs, towards your platform.

What to do: This scenario differs from the others, because (whether it is actually true or not) the tactic of publicly announcing that radiation has been released is intended to encourage people to panic. And when word gets out that there may be dangerous levels of radiation in an area, there almost certainly will be a panic, with large numbers of frantic people clogging city streets, acting out, and making bad decisions.

Expect people to do ineffective things, such as crowd into area hospitals, to the point that doctors will not be able to treat most of them. You will have to be prepared to deal with both the radiation and the population, as you make your escape. Like all of the other scenarios, don your protective gear, and evacuate cross-wind, to get out of the danger zone. The main difference is that, since many people will be in panic mode, they are more likely to cause you problems in the process.

Even in a subway, you can still find materials to improvise protection, if you don't have an evac kit. Go to the nearest restroom, and grab some paper towels or toilet paper to breath through, until you can get to the nearest store or office building. Acquire better protection, and then escape.

Be prepared to look out only for yourself and your family; trying to save everyone will only result in your dying with them. While this seems harsh, those who haven't taken a few minutes to learn about how to survive radiation dangers are going to be so ill-prepared, that they will soon perish in any area with high radiation levels. You can't stand around absorbing rads, trying to educate them.

Once the attack has taken place, save yourself, friends and family. Don't worry about those who were not prepared, but be ready to defend yourself, if anyone tries to take your protective gear.

During such a time of panic and confusion, you'll need to be careful that you don't get sucked into unwise decisions or suggestions from others, who will not have any real idea of what is going on. Other people's lack of survival knowledge will cause them to give out some very bad advice.

This will include many "authorities", who are completely ignorant of what a dirty bomb attack would be like. News reporters, your boss, policemen, national guard troops, etc., may all be giving orders and instructions which, if followed, could result in the death of you and your loved ones. Ignore the chaos, and escape the danger zone as quickly as possible, before some bureaucrat decides to declare martial law, and set up roadblocks at all of the exits.

If you're away from home and can't get back to your family, don't seek shelter in a place which will gradually become packed with people. This includes all US "public fallout shelters" which, sadly, are now just signs on public buildings, with no equipment, no food or water, and no trained staff.

Even if there was a fully-stocked fallout shelter in the attack zone, it would be suicidal to go there, because even the best fallout shelters are only designed to protect people from the (relatively) short-term dangers posed by fallout from a conventional nuke. Dirty bomb radiation will not decay and drop to a safe level any time soon, so you will be much better off if you evacuate. To put it bluntly, public shelters are death traps.

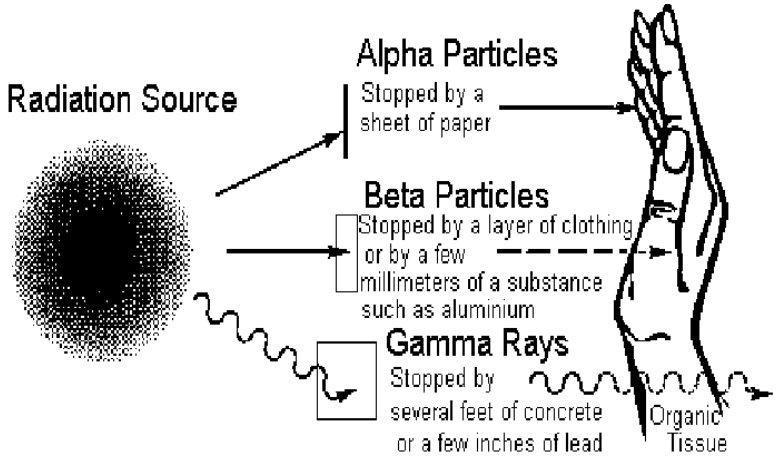
Decontamination: Once you have escaped the dust cloud from the bomb blast, you still have to remove the radioactive dust particles from your body and clothing, as soon as possible. After getting a safe distance away from the danger zone, you can remove your protective gear and discard it, preferably in a sealed plastic bag, in an isolated dumpster.

Don't keep it, buy new gear later. You will need clean clothes to change into, including different shoes, after you are clean. The old clothes should also be discarded, just like the protective gear, but first you have to get your body clean. Take several showers, using lots of shampoo each time, and scrubbing the entire body thoroughly with a washcloth, especially the hairy areas.

Trim your fingernails, and clean thoroughly underneath them. Clean the wax out of your ears. Blow your nose multiple times (use a saline nasal spray, if possible). Brush your teeth and floss, rinsing thoroughly, and then repeat. Use eye drops, or rinse out your eyes thoroughly with water. Any wounds you may have received during your escape should be cleaned, by washing carefully with soap and water, then treated with antibiotic cream and covered with bandages.

Once you are as clean as possible, put on your fresh clothes, collect up any friends and family, and then follow my advice about leaving town. If your vehicle was inside the dust cloud, you can take it through a car wash, and vacuum out the interior thoroughly (including the air vents), but it is safer to switch to a vehicle that was never in the dust cloud, if at all possible.

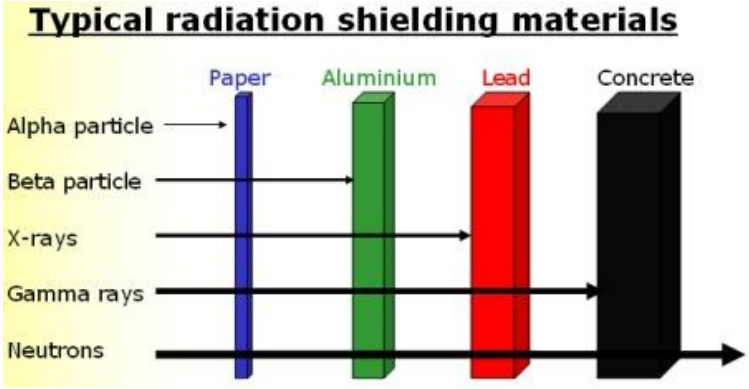
Note that if you can't wash for some reason, you should remove as much dust from your body as possible, by brushing your hair, wiping down your skin with a rag, damp sponge, or baby wipes, and shaking out your clothes, or vacuuming them as best as possible. If you feel itchy anywhere, you should clean that area again, as itching is an early indicator of beta burns from rad particles.


Radiation Source
Alpha Particles
Stopped by a sheet of paper
Beta Particles
Stopped by a layer of clothing or by a few millimeters of a substance such as aluminium
Gamma Rays
Stopped by several feet of concrete or a few inches of lead
Organic Tissue

How Radiation Hurts The Body: There are three kinds of radioactive particles that will harm you, if you come into contact with them. All three are certain to be present in the dust cloud from a dirty bomb attack, so here is a quick guide, to each one.

First is Alpha particles, which are the weakest. Alpha radiation is so weak that it can't penetrate your skin. Even a sheet of paper will block 100% of all Alpha radiation, so the only danger from Alpha is if the particles are inhaled, ingested, or get into an open wound. Even the very weak Alpha can cause long-term tissue and organ damage, if it gets inside your body. This is why having respiratory protection is so important; your filter mask will save you from being fried from inside.

The second type of radioactive particle is Beta, which is stronger than Alpha. Beta radiation can penetrate your bare skin, but it can't penetrate most clothing. This is why an outer protective garment is important, to keep the Beta particles off your bare skin. Any Beta particles that land on exposed skin will not only damage the inner tissues, they will actually cause burns on the skin surface, after several hours of contact. These small burns may look like measles, but they will heal up in time, as long as your body isn't weakened so much that it can't fight off infections. The other danger with Beta is that it will cause even more internal damage than Alpha, if it is inhaled or ingested. Beta will also cause internal burns, in the nasal passages, lungs, and digestive tract, so again you can see the value of respiratory protection.



The third type of radioactive particle is called Gamma. Although people tend to refer to gamma radiation as gamma rays, don't get confused by the terms. It is the ability of particles that are throwing off the gamma radiation to harm your body that we are concerned with, and what to do about it. Gamma has a lot more energy than Alpha or Beta, and can penetrate most barriers. Gamma can shoot right through your body, as well as your house and your car. Only thick layers of lead, or several feet of earth or concrete, can shield you from nearby Gamma radiation, but distance can easily shield you from all three types. This is why escaping the dirty bomb dust cloud is so important; you need to put several miles of distance between yourself and the radioactive area, and you need to escape as quickly as possible, because time is the other big factor.

Time and Radiation: There are three technical terms used when talking about radiation, roentgens, rads, and rems. Roentgens are how much radiation is present in any given location, and rems are how much damage radiation does to the body. For our purposes we can ignore these two, and just focus on rads.

Radiation Dose/Time Relationships

ACUTE EFFECTS	1 WEEK	1 MONTH	4 MONTHS
Medical care not needed	150 R	200 R	300 R
Some need medical care [very few deaths]	250 R	350 R	500 R
Most need medical care [50% die]	450 R	600 R	*

Rads are measured in two ways; rads per hour, and total rads. This is much like driving a car, where you want to know your speed (miles per hour), which can vary all over the place as you drive, and your total miles traveled, which will start low, but will always increase as you drive.

Rads per hour is like miles per hour in that you can absorb a lot of radiation in a very short amount of time, if the radiation level is high (instead of travelling fast, you are being damaged fast). Total rads is like total miles traveled, in that any radiation you absorb is cumulative, or it all adds up to a grand total of how much radiation you have absorbed.

So if you were in an area where the radiation level was 100 rads per hour, and you stayed there for one hour, you would have absorbed 100 rads. In two hours you would have absorbed 200 rads. But if you left after the first hour (with a total of 100 rads), and went to a place where the radiation level was 1 rad per hour, and stayed there for 100 hours (absorbing another 100 rads), your total rads would also be 200 rads. You are still absorbing rads, and adding to your total radiation damage, just not as fast.

This is just how much your body absorbs from outside. If you inhale radioactive particles, you will not only get more damage from the internal particles, but you will get more time damage, because you can't get rid of the internal particles. See why a filter mask is important?

How Many Rads Will Kill Me?: The lethal rad dose will vary somewhat between individuals, but the hard and fast rule is that 1000 rads will kill anybody. In other words, if you are exposed to 1000 rads per hour, for one hour, your total rad dose is 1000 rads, and you are 100% guaranteed to die (within an unpleasant day or two). If you are exposed to 100 rads per hour, for 10 hours, your total rad dose is also 1000 rads, and you are also doomed. Or with 10 rads per hour, for 100 hours.

500 rads will give anyone radiation sickness, to one degree or another, with a 50% chance that you will die. The faster you absorb the 500 rads, the worse your odds of surviving the sickness will be.

250 rads will make roughly half of the people who absorb it sick, but the other half will have little or even no radiation sickness symptoms, and most people will recover from the sickness. This is if you get a total of 250 rads in a week or less. If it takes you a month or longer to reach a total of 250 rads, you will probably not show any symptoms.

100 rads will almost never cause you to have any symptoms, unless you continue to absorb more. (Remember that it is total rads that we need to worry about.) 6 rads per day is about the maximum that a human can absorb on a continuous basis, while being able to fight off the health effects.

From all of this information, you can see why having detection equipment is important. Because the dust cloud from a dirty bomb will be relatively small, covering only a city block or two, it should be possible to get away from the radiation area in ten or fifteen minutes.

So even if you were right in the cloud, and the radiation level was 1000 rads per hour, if you escaped in fifteen minutes you would have only absorbed 250 total rads, and will almost certainly survive, if you wore protective gear, and decontaminated yourself afterwards.

But if you were in the cloud, and the radiation level was only 500 rads per hour, but it took it you two hours to discuss things with your co-workers and decide on a course of action, you would have absorbed 1000 rads, and would be doomed to die. This is why having a plan, and an evac kit, can literally make the difference between living and dying.

But remember, 99% of the population of any city attacked by a dirty bomb will survive without lifting a finger, because they will not be in the danger zone. Knowing what to do, and having an evac kit, is simply a prudent form of life assurance, for us preparedness-minded folks.